

WHAT IS CLAIMED IS:

1. A method of evaluating a reliability of a memory segment, the method comprising the steps of:

counting malfunctioning elements in at least one instance of a defined geometric pattern of said memory segment;

5 declaring a fault condition within said memory segment if a number of said counted malfunctioning elements at least equals a fault threshold; and

re-mapping said memory segment in response to said declared fault condition.

2. The method of claim 1 wherein said step of counting malfunctioning elements comprises the step of:

counting malfunctioning elements in at least one column of said memory segment.

3. The method of claim 2 wherein said step of counting malfunctioning elements in at least one column of said memory segment comprises the step of:

counting malfunctioning elements in all columns of said memory segment.

4. The method of claim 1 wherein said step of counting malfunctioning elements in a defined geometric pattern comprises the step of:

counting malfunctioning elements in at least one row of said memory segment.

5. The method of claim 1 wherein said step of declaring said fault condition comprises the step of:

setting a flag indicating one of a pass condition and a fail condition for said memory segment.

6. The method of claim 5 further comprising the step of:
discarding a result of said counting step upon completing said step of setting said flag.

7. The method of claim 1 further comprising the step of:
avoiding recording a total number of said counted malfunctioning elements in said
memory segment.

8. The method of claim 1 further comprising the steps of:
loading test data into said memory segment;
reading said loaded test data from said memory segment; and
comparing said read loaded test data to expected data for at least one element of said
memory segment.

9. The method of claim 1 further comprising the step of:
determining said fault threshold based upon at least one characteristic of said memory
segment.

10. The method of claim 1 further comprising the step of
resetting a count of malfunctioning elements after said counting step.

11. A system for maintaining an operation of a memory segment, the system comprising:

means for evaluating elements of said memory segment in row-fast order;

means for identifying faulty ones of said evaluated elements;

5 means for generating a count of said identified faulty ones of said evaluated elements found for each column of said memory segment; and

means for establishing one of a pass condition and a failure condition for said memory segment based on a value of said count of said identified faulty ones of said evaluated elements.

12. The system of claim 11 further comprising:

means for preserving information about said generated count for only one column of said memory segment at a time.

13. The system of claim 11 further comprising:

means for resetting a count of said identified faulty ones of said evaluated elements upon initiating traversal of a new column.

14. The system of claim 11 wherein the means for establishing comprises:

means for comparing said generated count to a threshold value.

15. The system of claim 11 further comprising:

means for clearing one of said pass condition and said fail condition upon completing a traversal of said memory segment.

16. The system of claim 11 wherein said means for generating a count comprises:
means for incrementing a failure counter upon detecting one of said faulty ones of
said evaluated elements.

17. The system of claim 11 further comprising:
means for physically re-mapping said memory segment upon establishment of said failure condition for said memory segment.

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18. A method for preserving an operation of a memory segment, the method comprising the steps of:

evaluating elements of said memory segment in row-fast order;

identifying faulty ones of said evaluated elements;

5 determining a number of said identified faulty ones of said evaluated elements in each column of said memory segment;

comparing said determined number to a fault threshold value;

declaring a failure condition for said memory segment if said determined number is at least equal to said fault threshold value for any column of said memory segment; and

10 physically re-mapping said memory segment in response to said declared failure condition.

19. The method of claim 18 wherein said identifying step comprises the steps of:

storing evaluation data in said elements of said memory segment;

comparing said stored evaluation data to expected data for said elements of said memory segment; and

5 identifying elements for which said stored evaluation data does not match said expected data.

20. The method of claim 18 wherein said determining step comprises the step of:

incrementing a failure counter upon detection of a faulty element in said step of identifying.